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MAR 11 2011

Ref: 8EPR-N

Jacqueline A. Buchanan, Forest Supervisor
U.S. Forest Service
Bridger-Teton National Forest
P.O. Box 1888
Jackson, Wyoming 83001

Re: Draft Environmental Impact Statement for the Eagle Prospect and Noble Basin Master Development Plan Project
CEQ # 20100461

Dear Ms. Buchanan:

In accordance with our responsibilities under Section 102(2)(C) of the National Environmental Policy Act (NEPA), 42 U.S.C. Section 4332(2)(C), and Section 309 of the Clean Air Act, 42 U.S.C. Section 7609, the U.S. Environmental Protection Agency Region 8 (EPA) has reviewed the Draft Environmental Impact Statement (Draft EIS) prepared by the U.S. Forest Service (USFS) for the Eagle Prospect and Noble Basin Master Development Plan Project.

The Draft EIS analyzes the potential impacts associated with Plains Exploration and Production Company's (PXP) proposed development of 136 oil and gas wells and associated access roads, pipelines, and production facilities in the Bridger-Teton National Forest near Bondurant, Wyoming. The project area lies within the Greater Yellowstone Ecosystem and includes high quality wildlife habitat, surface water and groundwater resources. Specifically, the project area includes moose crucial winter range, elk crucial winter range, elk and moose calving areas, and critical lynx habitat designated by the U.S. Fish and Wildlife Service. The project area also includes 4,281 acres of the Grayback Ridge Roadless area. In addition, the proposed project is located in an area with unique air quality challenges. The project area is located approximately 17 miles west of the Bridger Wilderness Area. The Bridger Wilderness Area is a federal Class I area under the Clean Air Act, requiring special protection of air quality and air quality related values, such as visibility. The Gros Ventre Wilderness and the Shoal Creek Wilderness Study Area are also located 12 miles and 8 miles, respectively, north of the project area. The project area is within Sublette County and the area has been recommended to be designated as non-attainment for the National Ambient Air Quality Standard (NAAQS) for ozone by the State of Wyoming. Finally, EPA notes the proposed project is within the 1.2 million acres protected in 2009 from future mineral leasing under the Wyoming Range Withdrawal Area.

PXP proposes to implement the project in two phases: exploration (Phase I) and field development (Phase II). Phase I includes constructing, drilling, completing, and operating three exploratory wells and associated facilities from a single well pad. The wells will be drilled to depths of approximately 12,500 feet. If the exploratory wells prove successful, PXP will proceed with full field development under Phase II. Phase II includes the development of 133 oil and gas wells from an additional 16 well pads, associated roads, and production facilities. The Draft EIS analyzes five alternatives: Alternative A, no action; Alternative B, the action proposed by PXP; Alternative C, which includes additional mitigation measures to reduce significant adverse impacts to wildlife, air quality and water quality; Alternative D, which includes modified Phase I access using a heavy-lift helicopter and low-standard access roads; and finally Alternative E, retirement of the leases. While Alternative B, C, and D are similar in the number of projected wells, well pads and production equipment, they differ in required mitigation measures and access to the project area during the Phase I exploration. Likewise, Alternatives A and E are similar in that no wells would be developed under these alternatives. Alternative C, with the additional mitigation measures, is the USFS identified Preferred Alternative.

EPA recognizes the considerable efforts of the USFS in preparation of the Draft EIS. Over the past year, the USFS worked closely with EPA and the Draft EIS addresses many of our concerns regarding air quality and water quality. However, EPA has a number of significant remaining concerns regarding protection of groundwater, monitoring and mitigation, and application of the no surface occupancy stipulations. In addition, our comments regarding groundwater characterization, aquifer protection, wetlands, and air quality are included in the attached detailed comments. We hope to continue our work with the USFS to address these remaining concerns so as this project moves forward, the important water resources, public health, and other environmental values are adequately protected.

Groundwater Resources

EPA is primarily concerned with the project's potential impacts to groundwater resources. The project area includes important water resources of the highest value, including the Eastern Snake River Plain Sole Source Aquifer Streamflow Source Area. Designated by EPA under the Safe Drinking Water Act (42 U.S.C. 300 et.seq), a sole source aquifer is one which supplies at least fifty percent of the drinking water consumed in the area overlying the aquifer and with no alternative drinking water sources. By this designation, EPA has determined that if the sole source drinking water aquifer is contaminated, it would create a significant hazard to public health. In addition to being within this sole source aquifer designation, EPA further notes the project area includes important areas of alluvial aquifer recharge. As noted in the Draft EIS, shallow aquifers are more susceptible to contamination because a contaminant introduced at the surface can more rapidly enter the system, and there is little intervening soil to adsorb the contaminants before they reach the groundwater. Oil and gas activities, including construction, drilling, well stimulation, pipelines, produced fluid storage and transport, provide opportunities for the introduction of contamination into the groundwater including petroleum compounds (e.g. benzene, toluene, xylene, etc.). There are also approximately 45 domestic water supply wells within the project area associated with dispersed ranching developments. These important groundwater resources must be protected as the oil and gas development proceeds. EPA's

primary groundwater concerns and recommendations relate to: well design, monitoring and mitigation. Our significant concerns and recommendations reflect EPA's growing knowledge and understanding of potential impacts, and important mitigation measures, developed from work in Pinedale Anticline and Pavillion oil and gas fields especially over the past six months.

Well Design

Given the important groundwater resources in the project area, proper well design and construction is crucial to protecting groundwater resources. This information should be included in the Final EIS. EPA recommends the Final EIS specify how groundwater will be protected with the proposed casing and well design. In addition to drilling surface casing with water-based drilling fluids (Draft EIS, page 4-51), it is important to set surface casing to a depth that protects aquifers. The Final EIS should specify well casing and cementing in relationship to differing water quality zones. Prior drilling plans proposed by PXP included surface casing to 1,000 feet and intermediate casing to 5,200 feet with both fully cemented to surface. This information is not included in the design criteria provided in Appendix D or elsewhere in the Draft EIS. This proposed casing and cementing program would be protective of the Wasatch – Fort Union aquifers and EPA recommends that it be clearly committed to in the Final EIS and Record of Decision (ROD) for Phase I.

For Phase II, EPA suggests the USFS develop an adaptive management process based on information collected through monitoring and logging surface Tertiary geology during Phase I. Open-hole logging of the Tertiary Wasatch – Fort Union aquifers in the project area would be critical in designing gas well casing and cementing to protect aquifers from fluid and gas migration. Upon completion of baseline water monitoring and logging of the water supply wells and the exploratory wells, EPA suggests a well design report be issued for public review and comment. The report should explain the adaptive management process that will be used to determine the appropriate well design and identify mitigation measures to protect the aquifers in the project area during Phase II. Finally, EPA recommends that BLM inspectors be onsite to oversee casing and cementing operations to further ensure wells are constructed according to approved plans.

Groundwater Monitoring and Mitigation

The sensitivity of the groundwater resources and the potential for significant adverse and irreversible impacts to these resources and public health warrant a thorough and effective monitoring and mitigation program. While the Draft EIS suggests many important mitigation and monitoring measures will be in place, more detail is necessary to confirm full protection will be provided. The groundwater monitoring program described under Alternative B (Draft EIS, page 2-58) should be clearly committed to under the Preferred Alternative C, In addition, EPA recommends the groundwater monitoring program be expanded and described in precise detail in a formal groundwater monitoring plan that is provided in the Final EIS and ultimately, the ROD. EPA recommends the groundwater monitoring program be expanded to include all aquifers that may be potentially impacted by proposed operations in the project area. Monitoring of shallow and deep aquifers is necessary to assure the mitigation measures are successful. Project activities

should be modified, as appropriate, to reduce impacts to groundwater. The monitoring program should be developed to detect changes in groundwater quality and quantity that could result during all phases of project implementation including background conditions prior to construction, during drilling and production activities, and after project termination. EPA's specific recommendations for the monitoring program and mitigation are included in our attached detailed comments.

No Surface Occupancy (NSO) Stipulations

Given the rugged terrain, sensitive soils and landslide potential, the project area includes several areas designated as "no surface occupancy" (NSO) due to unstable soils and/or steep slopes. In addition, the project area includes areas designated as "no ground disturbance" due to the 500 foot riparian buffer identified by the Wyoming Game and Fish Department. EPA commends the inclusion of these important mitigation measures which are designed to protect sensitive soils and critical wildlife habitat. These mitigation measures also appear to be consistent with the Jackson Hole Area Oil and Gas Lease Stipulation which was developed in 1947 to provide protection of scenic, wildlife and water resources in the Teton National Forest, including the proposed project area.

EPA is, however, concerned by the substantial number of roads and well pads that are proposed to be developed within both the 500 foot riparian "no ground disturbance" buffer (Figure 3-7, Draft EIS, page 3-62) and within the "no surface occupancy" areas (Figure 3-5, Draft EIS, page 3-46). As described in the Draft EIS (Table 2-3, page 2-37), these roads will at times receive both heavy traffic during development and year round traffic as gas and production fluids are collected for disposal or market. The Final EIS should clearly explain the USFS's rationale for proposing that this project proceed in these areas designated for specific protection; disclose environmental impacts associated with waiving the mitigation measures and stipulations; and explain how this is consistent with the Forest Plan and the Jackson Hole Oil and Gas Lease Stipulation. Much of the oil and gas development appears to be proposed within an area to be "managed for high quality wildlife habitat, escape cover and dispersed recreation" under the Forest Plan (Draft EIS, page 1-18). The Final EIS should include quantification of the acres and miles of roads and well pads that will be developed through these areas of NSO and/or no ground disturbance. The Final EIS should also indicate if, and how, roads built to withstand sensitive soils and landslide potential will be reclaimed at the close of the project. Finally, EPA recommends the Final EIS explore an alternative which would allow the project to move forward with the full mitigation measures and stipulations in place.

EPA's Rating

Consistent with section 309 of the Clean Air Act, it is EPA's responsibility to provide an independent review and evaluation of the potential environmental impacts of this project. In accordance with our policies and procedures for reviews under NEPA and Section 309 of the Clean Air Act, EPA is rating this Draft EIS as "Environmental Objections – Insufficient Information" (EO-2) because our review has identified significant environmental impacts to groundwater that should be avoided to provide adequate protection to the environment and

public health. EPA believes potential impacts to water resources can be minimized; and it is critical that an appropriate well design, mitigation and monitoring program be prepared in advance of the development. This is particularly important for Eagle Prospect project area which includes the Eastern Snake River Plain Sole Source Aquifer Stream Flow Protection area, aquifer recharge areas, and the headwaters of several rivers. EPA reiterates our commitment to work with the USFS to address our concerns in the Final EIS. With a comprehensive mitigation and monitoring plan, we hope to assure protection of these valuable water resources. If you have any questions regarding our comments or this rating, please contact me at 303-312-6004 or Joyel Dhieux, NEPA Lead Reviewer, at 303-312-6647.

Sincerely,

Larry Svoboda
Director, NEPA Compliance and Review Program
Office of Ecosystems Protection and Remediation

Enclosures: Detailed Comments
EPA's Rating System Criteria

cc: Kurt Davis, U.S. Forest Service

**Detailed Comments by the U.S. Environmental Protection Agency for the Draft Environmental Impact Statement (Draft EIS) Eagle Prospect and Noble Basin Master Development Plan Project Sublette County, Wyoming**

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Air Quality

Understanding the sensitive air resources in the project area, the USFS conducted a thorough analysis of potential air quality impacts including both photochemical and dispersion air quality modeling. Through this air analysis, several important mitigation measures were identified and committed under the USFS Preferred Alternative C. EPA commends the USFS for its efforts in analysis of air quality impacts and the commitment to mitigate adverse air quality impacts. In particular, EPA applauds the USFS's commitment to ensure visibility is protected at the Class I Bridger Teton National Forest and the sensitive Class II Gros Ventre Wilderness Area and Shoal Creek Wilderness Study Area.

The Draft EIS identifies several critical mitigation measures necessary to ensure compliance with the National Ambient Air Quality Standards (NAAQS). Under the Proposed Action Alternative B, without these critical mitigation measures, exceedances of the particulate matter (24-hour $PM_{10}$, 24-hour $PM_{2.5}$, annual $PM_{2.5}$), sulfur dioxide (one-hour $SO_2$) and nitrogen dioxide (one-hour $NO_2$) NAAQS are predicted to occur. Further, without the mitigation measures, emissions from the proposed action would exceed air quality related values for visibility at both the Bridger and Fitzpatrick Class I Wilderness Areas. Thus, EPA appreciates the inclusion of these mitigation measures in the USFS Preferred Alternative C, in Table 2-8, and the subsequent discussion of air quality mitigation in the Draft EIS.

EPA recommends the Final EIS build upon this foundation and include a detailed air quality mitigation plan. A more comprehensive and detailed air quality mitigation plan is particularly important given the elevated ozone levels that have been recorded at ambient air monitoring stations in the upper Green River Basin in February and March 2011. In accordance with the Council on Environmental Quality (CEQ) Mitigation Guidance (Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact, January 14, 2011), EPA recommends this plan clearly identify the required mitigation; how the mitigation will be monitored and enforced; and a mechanism that provides for public involvement and transparency. The air quality plan should allow for tracking of the implementation of mitigation commitments to ensure they are being performed as described in the NEPA document.

The Draft EIS discloses short-term (one-hour) concentrations of formaldehyde in excess of the recently revised reference exposure level (REL). The REL is an acute-dose response value that is used for screening risk assessments. The REL is established at concentrations below which no adverse health effects are expected. The Draft EIS estimates formaldehyde concentrations at 82.5 $\mu g/m^3$ in the immediate vicinity of the project area for Phase II of

Alternative B, the Proposed Action (Draft EIS, Table 4-9, page 4-11). While the Draft EIS indicates this is below the comparison standard, EPA notes the REL for formaldehyde has recently been lowered to 55 $\mu g/m^3$. The Final EIS should explain how formaldehyde concentrations will be reduced to ensure no adverse health effects.

Additional Detailed Air Quality Comments

Air Quality (Draft EIS, page 3-12)
The Draft EIS indicates "air quality in the project area is considered to meet federal and state air quality standards." EPA notes the project area is within Sublette County and the area proposed for designation by the State of Wyoming as non-attainment for ozone. Thus, the project area is not within an area currently meeting the federal ozone standard.

Air Quality (Draft EIS, page 4-9)
The Draft EIS concludes Phase I alternatives would be expected to meet the one-hour $NO_2$ standard based on the small potential emissions, reduced activities and the annual $NO_2$ impacts predicted. EPA understands that the Preferred Alternative also applies several important mitigation measures that reduce nitrogen oxide emissions, including nitrogen oxide controls on drill rigs and compression engines (Draft EIS, page 2-65). Please provide additional clarification.

Air Quality (Draft EIS, page 4-13)
EPA recommends the Final EIS include impacts to the Shoal Creek Wilderness Study Area in Table 4-12. Located eight miles north-west, Shoal Creek is the closest sensitive Class II area to the project area.

Air Quality (Draft EIS, page 4-18)
The Draft EIS refers to additional important mitigation measures to reduce greenhouse gases including green completions, low-bleed pneumatics, etc., yet these measures are not identified as part of the Preferred Alternative. EPA recommends these measures be included in the Preferred Alternative in the Final EIS.

Groundwater Monitoring and Mitigation

EPA recommends the Final EIS include a comprehensive and detailed groundwater monitoring and mitigation plan for all aquifers that may be potentially impacted by proposed operations in the project area. The following are EPA's specific recommendations for enhancements to the groundwater monitoring and mitigation:

- Monitoring at least 10 wells in the project area prior to Phase I activities. The wells should be distributed among alluvial, shallow Tertiary and deep Tertiary wells in order to characterize pre-Phase I baseline conditions.

- In order to establish baseline conditions for groundwater levels and quality, multiple samples should be collected from wells to be able to establish statistically sound baseline

conditions for the alluvial aquifers and the Wasatch – Fort Union aquifer for each well selected to be monitored for Phase I. The monitoring plan should generally characterize the quality and quantity of water in aquifers and should also be able to establish the expected conditions for each existing well to be able to detect changes that are statistically significant.

- Monitoring a selected number of shallow and deeper wells that are closest to the project gas wells and pad areas. Shallow groundwater monitoring at the Phase I pad should consist of at least one up-gradient and two down-gradient monitoring wells.

- Deeper aquifer monitoring during Phase I should consist of monitoring the deeper water supply well and a selection of nearby deeper existing water wells.

- For Phase II, EPA recommends monitoring all existing water wells in the project area for baseline conditions.

- All baseline groundwater monitoring for Phase I and Phase II should include: general field parameters; typical geochemical parameters; volatile organic compounds (VOCs); semi-volatile organic compounds (SVOCs); light hydrocarbon gases (C1 to C10); diesel range organic compounds (DRO); and gasoline range organic compounds (GRO). If methane or other light hydrocarbon gases are detected, EPA recommends the methane be analyzed for isotopic ratios to determine biogenic or thermogenic origin and compared to the isotopic signatures of production gases.

- Should any water well have demonstrated changes that damage existing and future water supplies, the project proponent should agree to provide alternative water supplies. This agreement should be included in the Final EIS and ROD.

- Finally, EPA recommends the Final EIS identify how the monitoring and mitigation program will be funded and enforced. A mechanism for public involvement should be provided for transparency and accountability.

EPA is committed to working closely with the USFS towards developing a groundwater monitoring and mitigation plan for the Final EIS. With a comprehensive mitigation and monitoring plan, we hope to assure protection of these valuable water resources.

Groundwater Characterization and the Wasatch – Fort Union Aquifer Systems

We commend the USFS for the excellent maps with locations of existing water wells within the project area. The Draft EIS also provides a good understanding of surficial geology. EPA recommends the Final EIS include additional information regarding the geology and hydrology. Additional information on groundwater characterization and the Wasatch – Fort Union aquifer system is essential to ensure appropriate well design, mitigation and monitoring measures.

EPA is concerned that the water quality information included in the Draft EIS is not indicative of the water quality in the recharge area. The Draft EIS refers to water quality information for groundwater that is representative of areas close to the center of the basin or representative of production fluids where the Wasatch – Fort Union aquifer produces gas. This information (especially for the Wasatch and Fort Union aquifers) is not representative of the expected water quality that would be found within a recharge area and the project area at the margin of the Greater Green River Basin where these aquifers are shallower and are not a production zone for gas or oil. EPA suggests that the Final EIS refer to and incorporate the recently published Green River Basin 2010 Groundwater Report as part of the Greater Green River Basin Water Management Plan.

EPA specifically notes the water quality information presented in Table 3-17 (Draft EIS, page 3-40) for the Wasatch – Fort Union aquifer is not representative of the project area and demonstrates a need for gathering baseline information prior to Phase I and Phase II project activities. The closest sample listed is 16 miles from the project area and the other three sample locations are 40 to 60 miles away near the center of the basin. While samples located at some distance can be representative of another area, this requires that the samples be collected from a similar hydrologic zone. These samples were not taken from a recharge zone for the Wasatch – Fort Union aquifer and therefore are not expected to represent conditions in the project area. Even the closest sample at 16 miles is located in a marginal recharge zone and closer to the center of the basin according to the Green River Basin 2010 Groundwater Report. If information more indicative of the project area cannot be found, EPA suggests heavily qualifying the information in Table 3-17 as not representative of the project area until project sampling can be undertaken and results compared.

The Green River Basin 2010 Groundwater Report includes important new information that should be considered and included in the Final EIS. This report provides valuable information on characteristics of the Wasatch – Fort Union aquifer (See Green River Basin 2010 Groundwater Report, Figures 5-1, 5-3 and 5-16). Notably, the Green River Basin 2010 Groundwater Report references the Fort Union formation as an aquifer, specifically the Wasatch – Fort Union aquifer. EPA recommends the description of the Fort Union formation be revised as appropriate (Draft EIS, page 3-35). In addition, EPA recommends supplementing the discussion of the geology and hydrology with the inclusion of a stratigraphic column that identifies and references the water bearing zones in order to represent the vertical spatial position of formation names and the location of aquifers with respect to production zones. There are stratigraphic columns demonstrating this in the Green River Basin 2010 Groundwater Report (see Figures 5-2, 5-3 and 5-26). There are also several geologic cross-sections in the Green River Basin 2010 Groundwater Report that should be referenced in the Final EIS. This information will be important to assuring the well construction and groundwater mitigation measures will be protective.

Eastern Snake River Plain Sole Source Aquifer

EPA recommends the Draft EIS include additional information regarding the Eastern Snake River Plain Sole Source Aquifer. The Final EIS should clearly discuss the potential impacts to this sole source aquifer and identify mitigation measures to address those impacts. EPA also requests that the Final EIS include a map that overlays the project area with the critical zone identified as the Eastern Snake River Plain Sole Source Aquifer Source Area. EPA can provide the USFS with these maps displaying the aquifer area and source area.

Pitless Closed Loop Drilling Systems

EPA supports the USFS's inclusion of pit-less, closed-loop drilling systems as a measure to better protect water quality in the project area. Under the Preferred Alternative, closed loop drilling would be employed throughout the development (Draft EIS, page ES-27), precluding pits from containing cuttings and drilling mud, and allowing only small sump and flare pits. This is an important mitigation measure especially since the watershed is located within the Eastern Snake River Plain Aquifer surface water contribution area. EPA is concerned, however, because this mitigation measure and the statements made in the Executive Summary are not carried through the rest of the document. For example, the Draft EIS refers the reader to the design criteria included Appendix D for both the Proposed Action and the Preferred Alternative. Appendix D, however, describes the design criteria and conditions of approval for the Proposed Action and includes the use of various pits that would be used to hold drill cuttings, produced water and stimulation flow back materials. Table 2-11 which includes a summary of the Environmental Protection and Mitigation Measures also appears to indicate that cuttings pits would be allowed under the Preferred Alternative C (Draft EIS, page 2-117). EPA recommends these inconsistencies be addressed in the Final EIS. For clarification, EPA recommends the Final EIS include an additional appendix with the specific design criteria and conditions of approval for the Preferred Alternative.

Hydraulic Fracturing

The Draft EIS projects that 800,000 gallons of water will be used per well for fracture stimulation. The Draft EIS also indicates that diesel fuels will not be used by PXP (Draft EIS, page 2-30). The Final EIS should also disclose what fluids will be used for stimulation purposes in order to determine what other compounds could be monitored to determine if there are impacts to shallower aquifers from the stimulation process. If stimulation fluids (hydraulic fracturing) will include diesel, the stimulation process will need prior approval under the Safe Drinking Water Act. In addition to disclosing the anticipated fluids to be used for the hydraulic fracturing, EPA recommends the Final EIS also provide an estimation of flow-back volumes to assure the proposed project has appropriately estimated water management needs.

Underground Sources of Drinking Water (USDWs)

The Draft EIS states that no deterioration of groundwater quality is expected from any injection of production fluids if injection wells become necessary. Accordingly, EPA understands that any future injection zones would not meet the definition of a USDW or an aquifer or water bearing zone with 10,000 total dissolved solids (TDS) or less. In addition, EPA expects that because there will be no pits associated with production wells, there will also be no pits associated with drilling any potential injection wells or storage of fluids to be injected. It is expected that all fluids for injection will be contained in tanks. The Final EIS should clarify and confirm how the fluids for injection will be managed.

On a related issue, EPA recommends the Final EIS include a definition of the term "useable water zones" (Draft EIS, page 2-29) which is included in the document in terms of groundwater protection and well design. EPA recognizes and defines USDWs as aquifers that can supply water to a well with less than 10,000 mg/l TDS.

Casing and Well Design

As previously noted, proper casing and well design is essential to protection of groundwater resources. The Draft EIS frequently refers the reader to Appendix D for specific information for casing and cementing design requirements that will be required for the Master Development Plan. However, Appendix D does not appear to include any details on casing and cementing requirements that would be employed to protect groundwater. EPA recommends the Final EIS include specific well casing and cementing design requirements, particularly for the Preferred Alternative. In addition, the Draft EIS states that zones of non-economically producible gas may be encounter during drilling (Draft EIS, page 2-29). EPA recommends that these zones if encountered be isolated with casing and cement to prevent contamination of shallow aquifers.

Aquifer Protection

EPA is concerned water withdrawals for project activities could impact shallow Wasatch – Fort Union wells. While the Draft EIS indicates there will be no impacts to water levels in the project area due to water supply withdrawals for project activities (Draft EIS, page 4-53), this statement cannot be supported without water level monitoring, aquifer pump tests, or groundwater modeling. At a minimum, an aquifer pump test on a water supply well, appropriate modeling and logging information from water supply wells, as well as the geologic information would be needed to make definitive statements related to the level of impact. The Green River Basin 2010 Groundwater Report indicates there is connectivity within the Wasatch – Fort Union aquifer to the extent that large withdrawals could impact nearby wells in shallower zones.

EPA recommends the Final EIS include monitoring and mitigation measures to minimize impacts from water withdrawal. While the Draft EIS currently refers to Appendix D for this information, no best management practices (BMPs) or mitigation measures to minimize impacts from water withdrawals are listed in the Appendix. In order to establish changes or fluctuations

to groundwater (levels), a baseline water level monitoring program is necessary. This cannot be done without a monitoring well system that can assist in establishing natural fluctuations in water levels and be able to discern hydrologic system upsets caused by project activities that could lower water levels in wells. The groundwater monitoring plan should be developed to include monitoring of groundwater levels. If groundwater levels are adversely impacted, EPA recommends alternatives to groundwater use be explored including hauling water from another area or recycling fluids to reduce the volume of water withdrawal from groundwater or hauled to the drill site. The Final EIS should evaluate the feasibility of these options. At a minimum, this type of adaptive management should be included in the monitoring and mitigation plan that is developed for this project and included in the Final EIS.

Additional Detailed Comments on Appendix D

Appendix D, General Comment
As previously stated, EPA recommends the USFS include the design criteria and conditions of approval specifically for the Preferred Alternative in an individual Appendix in the Final EIS.

Appendix D, Location and Type of Water Well Supply (Draft EIS, Page D-5)
The standard water quality analysis should also include the analytes specified on page 2-58 of the Draft EIS. As previously noted, EPA also recommends the groundwater monitoring include: general field parameters, typical geochemical parameters, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOC), light hydrocarbon gases (C1 to C10), diesel range organic compounds (DRO), and gasoline range organic compounds (GRO). While EPA is providing this comment on Appendix D, prepared for the Proposed Action, it is particularly important this additional monitoring be included in the conditions of approval and design criteria specific to the Preferred Alternative.

Appendix D, Location and Type of Water Well Supply (Draft EIS, Page D-5)
Cementing water wells behind the casing from 500 feet back to the surface will not prevent potential drainage/drawdown or contamination of upper aquifers. If there are no competent confining zones intervening between the depth of 500 feet and shallower wells this proposed mitigation will not be protective. If the aquifers are connected as the Green River Basin 2010 Groundwater Report suggests, then large withdrawals from depth can impact shallower well yields. EPA recommends this design criteria be re-evaluated to ensure it will be protective.

Appendix D, Methods for Handling Waste Disposal, (Draft EIS, Page D-5)
Item 2 contradicts statements in the Draft EIS concerning the placement of produced fluids in the cuttings pit under Alternative B or the Proposed Action. Please clarify item 2 for Appendix D and in the new Appendix to be developed for the Preferred Alternative design criteria.

Appendix D, Methods for Handling Waste Disposal, (Draft EIS, Page D-5)
Under items 3, 4, 5, 6, 9, produced water should not be contained in a cuttings pit. Production water should be characterized before the containment or disposal options are determined. Due to potential constituents such as benzene, all production fluids should be containerized until characterized under any proposed Alternative. EPA understands that under Alternative C (the

Preferred Alternative) there will be no cuttings pit and therefore all fluids, including hydraulic fracturing flow-back fluids, produced out of the wells will be containerized and removed from the site.

Spill Prevention, Control, and Countermeasures

Should a well blowout or large spill occur, impacts to water resources within the aquifer recharge area and Eastern Snake River Plain Sole Source aquifer could be considerable. While EPA understands the potential for such events are low, they must be planned for accordingly. The Draft EIS includes a commitment to the development of a Spill Prevention, Control, and Countermeasures Plan (SPCC); however, the SPCC plan and additional detail should be provided in the Final EIS. Implementation of site-specific SPCC plans for drill rigs and production facilities will reduce the potential for direct and indirect impacts to sensitive resources from spills or accidental releases of hazardous substances. It is critical that the SPCC plans are appropriately designed given local geology and the level of risk associated with local conditions (i.e. rugged terrain, aquifer recharge, and winter conditions). We recommend that USFS describe in the Final EIS how site-specific SPCC plans will address potential spills, how water resources will be protected should such an event occur, and describe access by emergency crews. This is particularly important for drilling within this remote, rugged, area.

No Surface Occupancy Stipulations

The Preferred Alternative includes several important stipulations to protect surface water and riparian areas. Under the Preferred Alternative, no ground-disturbing activities would occur within 200 feet of stream channels. To further protect wetlands and riparian areas, no ground disturbing activities would occur within 500 feet of riparian areas designated by the Wyoming Game and Fish Department, unless exceptions are granted by the USFS Authorized Officer. As indicated in EPA's cover letter, we are concerned by the substantial number of roads proposed within these riparian areas. In addition to providing a more detailed explanation of why these important stipulations will be waived, and the environmental impacts associated with the waivers, the Final EIS should discuss and identify how these impacts will be mitigated, and how any required compensation for wetlands, wildlife, etc. will be calculated.

Jackson Hole Area Oil and Gas Lease Stipulation (Krug Stipulation)

The Jackson Hole Area Oil and Gas Lease Stipulation ("Krug Stipulation") was developed by Secretary of the Interior Julius Krug in 1947, to provide better protection of scenic, wildlife and water resources in the Teton National Forest, including the proposed project area. EPA recommends the Final EIS clearly indicate how the Preferred Alternative is consistent with the Krug Stipulation. In particular, EPA recommends the Final EIS provide information and explanation on how roads constructed within the 500 foot riparian buffer area and in areas designated as no surface occupancy will be consistent with this lease stipulation. The Final EIS should identify any additional mitigation measures that may be necessary to ensure compliance with the Krug Stipulation.

Similarly, EPA notes the majority of the proposed project appears to be with an area designated to be "managed for high-quality wildlife habitat, escape cover and dispersed recreation" (Draft EIS, page 1-18). The Draft EIS indicates that exploration and development practices within this area should minimize road construction, noise and wildlife disturbance (Draft EIS, page1-21). EPA recommends the Final EIS describe how the Preferred Alternative is consistent with the Forest Plan. The Final EIS should also identify any additional necessary mitigation measures to ensure the project is consistent with the Forest Plan. Finally, EPA also suggests the Final EIS indicate how compliance with the Forest Plan will be monitored.

Detailed Wetland Comments

Waters of the U.S., Wetlands and Floodplains (Draft EIS, page 1-28)
EPA commends the USFS for the excellent description of the requirements of Section 404 of the Clean Water Act (CWA), Executive Order 11990 and Executive Order 11988. EPA recommends the Final EIS also include a reference to the EPA and U.S. Army Corps of Engineers' rule on mitigation requirements for actions requiring a Section 404 permit. (33 CFR Parts 325 and 332; 40 CFR Part 230; 73 Fed. Reg. 19594 (April 10, 2008))

Water Resources, Indicators (Draft EIS, page 3-19)
EPA recommends the USFS consider including wetland effects and conditions as one important indicator to be used in monitoring watershed health. Wetlands are one of the few indicators that can track and monitor the conditional trend of a watershed (e.g., water quality and quantity, groundwater impacts and habitat).

Waters of the U.S. (Draft EIS, page 3-31)
The Draft EIS indicates that "the delineation of waters of the U.S. within the project area that would be affected by the proposed project is provided in the Wetlands and Potential Waters of the U.S. Delineation Report (ARCADIS 2010a)." EPA is unclear, however, if this delineation report has been verified by the U.S. Army Corps of Engineers, Wyoming Office. EPA recommends the Final EIS clarify whether the report has been approved by the U.S. Army Corps of Engineers. We note that only the U.S. Army Corps of Engineers and EPA make determinations regarding what is a water of the U.S. for purposes of the Clean Water Act.

Table 4-34. Proposed Vegetation Disturbance for Alternative B (Draft EIS, page 4-69)
Table 4-35. Proposed Vegetation Disturbance for Alternative C (Draft EIS, page 4-71)
It is important that the potential impacts to wetlands are clearly provided in the Draft EIS and EPA appreciates the inclusion of the wetland/potential wetland category in these tables. EPA is unsure, however, of the meaning of the "*" in the wetland/potential wetland column. We recommend this be defined in the Final EIS.

Wetland and Riparian Areas (Draft EIS, page 4-73)
The Draft EIS indicates that 170 acres of USFS land would be taken out of grazing potentially resulting in increased grazing pressure on wetlands and riparian areas. EPA recommends these areas be outlined on a map to allow the public and resource agencies to clearly identify where potential impacts may occur, and how the impacts will be minimized and/or mitigated.

Wetlands and Riparian areas Phases I and II (Draft EIS, page 4-74)
The Draft EIS indicates that no ground-disturbing activities would occur within 200 feet of stream channels. To further protect wetlands and riparian areas, no ground-disturbing activities would occur within 500 feet of a Wyoming Game and Fish Department designated riparian areas, unless a case-specific exception is made by the USFS. The 500 foot buffer is displayed on Figure 3-7 Riparian, Wetlands, and Perennial Stream Crossings. EPA is, however, unclear on what activities may be allowed in a no ground disturbance area (e.g. vegetation removal). In addition, EPA notes Figure 3-7 indicates numerous roads, well pads, and support facility are proposed to be developed within the 500 foot buffer of no ground disturbance. The Final EIS should clearly indicate what activities will be allowed to occur in these areas of no ground disturbance. Further, EPA recommends the Final EIS clearly quantify the miles of roads and acres of well pads and associated facilities that will be allowed in areas of no ground disturbance or no surface occupancy.

Wetlands and Riparian areas Phases I and II (Draft EIS, page 4-74)
EPA recommends the Final EIS include a more detailed explanation of why 2.3 acres of potential wetlands were identified using the U.S. Fish and Wildlife Service's National Wetland Inventory and yet only 0.07 acres of wetlands were identified during the 2010 wetland delineation.

Roadless Areas

The project area includes 4,281 acres of the Grayback Ridge Roadless area. According to maps included in the Draft EIS, all of the proposed oil and gas wells and associated production facilities would be located within an area designated by the USFS as roadless (Draft EIS, page 3-112). EPA recommends the USFS include an explanation of how these additional roads are consistent with management of the Grayback Ridge Roadless area and the additional areas designated as roadless.

Noise

The Draft EIS estimates noise levels of up to 115 dBA at the source during drilling and flaring operations, with noise levels of 55 dBA at 3,500 feet (0.66 miles) from the source (Draft EIS, page 4-30). Under the Noise Control Act of 1972, Congress established a national policy "to promote an environment for all Americans free of noise that jeopardizes public health and welfare." Under the Noise Control Act, EPA identified $L_{dn}$ of 55 db outdoors in residential areas as the maximum level below which no effects on public health and welfare occur due to interference with speech or other activity. This threshold, however, may not be the appropriate noise level for quiet solitude and wildlife habitat expected in a National Forest. Existing noise levels in the project area are low (Draft EIS, page 3-18); thus, the increase in noise levels is likely to have a much greater impact. EPA recommends the Final EIS identify and consider implementation of mitigation measures to further reduce these potential noise impacts.

Mitigation

The USFS has carefully developed measures to mitigate and minimize the impacts associated with the exploration and development in the Eagle Prospect and Noble Basin. Given sensitive air, water and wildlife resources in the project area, successful implementation of these measures are critical for ensuring protection of the resources. The CEQ recently issued guidance for Federal agencies on establishing, implementing and monitoring mitigation (Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact, January 14, 2011). Consistent with this guidance, EPA specifically recommends:

(1) The Final EIS and ROD should clearly document the air quality, water quality, and wildlife mitigation measures, and any additional mitigation measures developed through the NEPA process, that are committed to under the Preferred Alternative.

(2) Each mitigation measure should be carefully monitored to ensure full implementation. The Final EIS and ROD should identify how mitigation measures will be monitored, funded and enforced to ensure successful implementation.

(3) The USFS should ensure public participation through proactive disclosure of the status and monitoring of the mitigation measures. For example, implementation, monitoring and enforcement of the mitigation measures should be readily available to the public via regular reports, stakeholder meetings, and/or the Internet.

Without successful implementation of mitigation measures identified in the Preferred Alternative, significant adverse impacts to air quality, water quality, wildlife and other environmental resources are predicted. Thus, it is critical that all efforts are made to ensure successful implementation of mitigation. While the Draft EIS encompasses many important mitigation and monitoring measures, more detail is necessary to ensure fully protective measures will be implemented. EPA is committed to working closely with the USFS towards developing a robust monitoring and mitigation plan for the Final EIS.

Night Skies

Starry night skies and natural darkness have become rare and are increasingly threatened by light pollution. Natural night skies are important and valued resources in many national forests, including the Bridger-Teton National Forest. EPA recommends the Final EIS evaluate the potential impact to night skies from drilling and production activities associated with the project. In addition, the Final EIS should identify and include mitigation measures to reduce the impacts to night skies from the proposed development.

Executive Summary and Comparisons of Alternatives

EPA recommends the USFS provide further clarification and explanation of the potential impacts associated with Alternative D. In many cases, the potential impacts are determined to be

more significant than Alternatives B and C, but no detailed explanation is provided. For example in ES.4.1.5 Wildlife and Fisheries, Including Special Status Species (Draft EIS, page ES-35), impacts that would occur in the implementation of Alternative "D" are stated as "Phase I of this alternative would significantly negatively impact Canadian lynx in the Wyoming Range through plowing the main access road along the South Rim, which would cause compaction and reduce habitat effectiveness for this species." Alternatives B and C, however, would also have impacts on the South Rim with the widening and of the existing road, construction of a new roadway and winter plowing in the Upper Hoback South and Middle Beaver Creek Lynx Analysis Units (LAU). As stated on page 3-84, "Portions of the project area including the South Rim and parts of the Middle Beaver Creek drainage have been described as prime lynx habitat (Berg et al. 2008)." More detailed and clear explanations will ensure the public, and ultimately the decision maker, is able to sufficiently compare the impacts associated with each of the alternatives.

# U.S. Environmental Protection Agency Rating System for Draft Environmental Impact Statements

## Definitions and Follow-Up Action*

### Environmental Impact of the Action

**LO - - Lack of Objections:** The Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

**EC - - Environmental Concerns:** The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

**EO - - Environmental Objections:** The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

**EU - - Environmentally Unsatisfactory:** The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

### Adequacy of the Impact Statement

**Category 1 - - Adequate:** EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

**Category 2 - - Insufficient Information:** The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

**Category 3 - - Inadequate:** EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.